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10/538,523	12/13/2005	Masanori Takeda	23085-10480	3561
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EXAMINER				
KONG, SZE-HON				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/538,523

Applicant(s)

TAKEDA ET AL.

Examiner

SZE-HON KONG

Art Unit

3661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14, 16 and 17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 16, 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 8/4/2009 have been fully considered but they are not persuasive.

On page 15 of the Applicant's Response, Applicant argues "Miura merely describes three classifications of the possible relations between two endpoints." and does not indicate the warning area, margin area and safety area.

The Examiner respectfully disagrees with the Applicant. Miura does disclose the same characteristics of a warning area, margin area and safety area as currently claimed with the area of impassable, undecided and passable determination. The impassable area being a warning area, the undecided area being a margin area and the passable area being a safety area accordingly.

On page 16 of the Applicant's Response, Applicant argues Mäkelä "merely describes that the vehicle must be able to reduce its speed and stop if an obstacle is detected too close to the vehicle" and does not "teach deciding the movement ease of the robot to a specific position required by the voice and image recognition based on the current position of the robot and the position of the obstacle

The Examiner respectfully disagrees with the Applicant. Mäkelä discloses detecting the distance to obstacles around the vehicle and the scanners can be "programmed to give a signal if an obstacle is detected in a warning area or in a separate safety area..." (Section 5.4), therefore

setting at least two or more areas based on the distance from the obstacle as presently claimed.

Applicant's arguments with respect to claims 1-14, 16 and 17 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claim 8 is objected to because of the following informalities: The term "exits" (line 20) should read "exists" to correct the inconsistency of the meaning of the claim language intended. Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 8, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bancroft et al. (US 2002/0165638 A1) and Frushour et al. (4,644,237).

As per claims 1, 8, and 16, Bancroft et al. discloses the claimed robot control device for controlling a robot (Paragraphs [0005] – [0006]) having a microphone (Fig 6, 725; Paragraph [0071]), an imaging device (Fig. 6, 718; Paragraphs [0060], [0065]) and a self-position detection device (Fig. 6, 720; Paragraphs [0043], [0048], [0051], [0060]) comprising: a voice recognition part for recognizing the designation content of a designator based on sounds collected by the microphone (Paragraph [0136]; a self-position estimation part for estimating the current position of the robot based on an

output from the self-position detection device (Paragraphs [0043], [0048], [0051], [0060]); a map data base for retaining map data registering at least the position of an obstacle (Paragraphs [0048], [0061], [0068]-[0070]); a decision part for deciding whether the movement to a specific position is required based on the recognition result of the voice recognition part and image recognition part (Paragraphs [0045], [0094], [0095], [0136]-[0139]); a movement ease decision part for deciding movement ease to the specific position based on the current position of the robot estimated by the self-position estimation part and the position of the obstacle from the map data base responsive to the movement to the specific position being required (Paragraphs [0043], [0048]-[0050], [0069], [0094], [0095]); a behavior decision part for deciding the behavior according to the movement ease decided by the movement ease decision part (Paragraphs [0043], [0048]-[0049], [0094], [0095]); and a behavior control part for executing the behavior according to the decision of the behavior decision part (Paragraphs [0043], [0048]-[0049], [0094], [0095]). Bancroft et al. further discloses a robot control program for making a computer mounted on a robot function (Paragraphs [0189], [0202], [0203], [0205], [0206], [0208]-[0211]).

Bancroft et al. does not explicitly disclose the claimed image recognition part for recognizing the designation content of the designator based on an image imaged by the imaging device. Bancroft et al. does disclose in the reference a camera that gathers information that is utilized by a variety of systems within the robot. Bancroft et al. further discloses in the reference using inputs from the interaction portion, which the camera is a part of, that moves the robot from a first location to a second location (Paragraphs

[0046], [0065], [0066], [0094], [0095]. From this teaching of Bancroft et al., it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the referenced camera as the claimed image recognition part for recognizing the designation content of the designator based on an image imaged by the imaging device, for example, the referenced using information from the interaction portion to move a robot from a first location to a second location, in order to perform a variety of services for customers (Paragraph [0038]).

Bancroft et al. further does not explicitly disclose the current position of the robot indicates at least one of a warning area, a margin area and a safety area in which the robot exists, and each of the area is set based on the distance between the current position of the robot and the obstacle. Frushour et al. discloses a collision avoidance system having a robot arm sensing a distance between an object and when the distance between the object is a first determined distance, a safety area, a control signal is generated; when the distance between the object is a second predetermined distance that is smaller than the first distance, a margin area, generate a second control signal and generate a stop signal when the distance between the object is a third predetermined distance, a warning area, smaller than the second distance. It would have been obvious for one of ordinary skill in the art at the time the invention was made to combine the teachings of Bancroft and Frushour to set a warning area, a margin area and a safety area based on the distance from the robot to an object to control the robot with appropriate action to avoid collision with the object.

8. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bancroft et al. (US 2002/0165638 A1) and Frushour et al. (4,644,237) as applied to claim 1 above, and further in view of Mäkelä et al. (May 2001).

As per claims 2 and 9, Bancroft et al. further discloses the claimed wherein the movement ease decision part reads the position of the obstacle surrounding the movement route to the specific position from the map data base, and the behavior decision part decides the behavior according to an area containing the specific position and an area where the robot exists (Paragraphs [0043], [0048]-[0050], [0069], [0070], [0094], [0095]). Bancroft et al. does not explicitly disclose the claimed sets at least two or more areas based on the distance from the obstacle. Mäkelä et al. in the same field of invention discloses the claimed sets at least two or more areas based on the distance from the obstacle (Section 5.4, *Obstacle avoidance*, page 581). From this teaching of Mäkelä et al., it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Bancroft et al. and Mäkelä et al. in order to detect obstacles in the direction of motion (Mäkelä et al., Section 5.4, *Obstacle avoidance*, page 581).

9. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bancroft et al. (US 2002/0165638 A1) and Frushour et al. (4,644,237) as applied to claim 1 above, and further in view of Miura et al. (May 1994).

As per claims 3 and 10, Bancroft et al. further discloses the claimed, wherein the movement ease decision part including: an obstacle recognition part for recognizing the obstacle surrounding the movement route to the specific position from the current

position of the robot estimated by the self-position estimation part and the map data, and wherein the movement ease to the specific position is decided based on the area including the specific position and the area where the robot exists, respectively, applicable to an area (Paragraphs [0043], [0048]-[0050], [0069], [0070], [0094], [0095]).

Bancroft et al. does not expressly disclose the claimed warning area set part for setting an area having a possibility to interfere with an obstacle as a warning area when the robot exists, based on the position of the obstacle recognized by the obstacle recognition part; a margin area set part for setting an area with a predetermined distance from the warning area as a margin area, wherein the predetermined distance is set by a plurality of characteristics associated with the robot; and a safety area set part for setting an area distant from the margin area as a safety area. Miura et al. in the same field of invention discloses the claimed warning area set part for setting an area having a possibility to interfere with an obstacle as a warning area when the robot exists, based on the position of the obstacle recognized by the obstacle recognition part; a margin area set part for setting an area with a predetermined distance from the warning area as a margin area, wherein the predetermined distance is set by a plurality of characteristics associated with the robot, the function of the vision system detecting the distances, size and shape (width) of the robot; and a safety area set part for setting an area distant from the margin area as a safety area (Fig. 3; Section 1-2, pages 3368-3369). Miura et al. discloses the claimed warning area, margin area, and safety area with the referenced impassable, undecided, and passable regions. From this teaching of Miura et al., it would have been obvious to one having ordinary skill in the art at the

time the invention was made to combine the teachings of Bancroft et al. and Miura et al. in order for a mobile robot to detect obstacles and free spaces (Miura et al., section 1, page 3368).

10. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bancroft et al. (US 2002/0165638 A1), Frushour et al. (4,644,237) and Miura et al. (May 1994) as applied to claims 3 and 10 above, and further in view of Tunstel (February 1995).

As per claims 4 and 11, the combination of Bancroft et al. and Miura et al. does not expressly disclose the claimed wherein the warning area set part decides the position of a circle where a distance between representative points of the surface of the obstacle is set as a diameter, and sets the warning area using the position of the circle. Tunstel in the same field of invention discloses the claimed wherein the warning area set part decides the position of a circle where a distance between representative points of the surface of the obstacle is set as a diameter, and sets the warning area using the position of the circle (Fig. 3; pages 588-589). From this teaching of Tunstel, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Tunstel with the teachings of Bancroft et al. and Miura et al. in order to deal with the numerous sources of uncertainty presented by the real world (Tunstel, Introduction, page 586).

11. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bancroft et al. (US 2002/0165638 A1) and Frushour et al. (4,644,237) as applied to claim 1 above, and further in view of Nourbakhsh et al. (US 2002/0013641 A1).

As per claims 5 and 12, Bancroft et al. does not expressly disclose the claimed wherein the behavior decided is one of a group of movement, movement refusal, reconfirmation of designation, stop movement, movement with caution, deceleration and acceleration. Frushour et al. discloses behavior of reducing the speed of the robot as the distance between the robot and the object gets closer, changing the movement and move with caution, and stop the movement of the robot. Nourbakhsh et al. in the same field of invention discloses the claimed wherein the behavior decided is one of a group of movement, movement refusal, reconfirmation of designation, stop movement, movement with caution, deceleration and acceleration (Paragraphs [0008], [0010], [0016], [0038], and [0042]). From this teaching of Nourbakhsh, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Bancroft et al., Frushour et al. and Nourbakhsh et al. in order for a robot to avoid collisions in an area (Nourbakhsh et al., Paragraph [0027]).

12. Claims 6 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bancroft et al. (US 2002/0165638 A1) and Frushour et al. (4,644,237) as applied to claim 1 above, and further in view of Perzanowski et al. (February 2001).

As per claims 6 and 13, Bancroft et al. does not expressly disclose the claimed wherein the voice recognition part has a designating range specification part for narrowing a designating area using a reference term, and the behavior decision part recognizes a specific position from the area of the logical product of the designating area narrowed by the designating range specification part and designating area recognized by the image recognition part. Perzanowski et al. in the same field of

invention discloses the claimed wherein the voice recognition part has a designating range specification part for narrowing a designating area using a reference term, and the behavior decision part recognizes a specific position from the area of the logical product of the designating area narrowed by the designating range specification part and designating area recognized by the image recognition part (Fig. 4; pages 17-18). From this teaching of Perzanowski et al., it would have been obvious to combine the teachings of Bancroft et al. and Perzanowski et al. in order to incorporate both natural language understanding and gesture recognition as communication modes (Perzanowski et al., page 16).

13. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bancroft et al. (US 2002/0165638 A1) and Frushour et al. (4,644,237) as applied to claim 1 above, and further in view of Bischoff et al. (October 1999).

As per claims 7 and 14, Bancroft et al. does not explicitly disclose the claimed further comprising a behavior schedule transmission part for outputting a behavior schedule. Bischoff et al. in the same field of invention discloses the claimed further comprising a behavior schedule transmission part for outputting a behavior schedule (Page 1003-1004). From this teaching of Bischoff et al., it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Bancroft et al. and Bischoff et al. in order to verify if the robot has well understood what the user requested (Bischoff et al., page 1003).

3. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bancroft et al. (US 2002/0165638 A1), Frushour et al. (4,644,237) and Miura et al. (May 1994) as applied to claims 3 above, and further in view of Nakamura et al. (6,044,321).

As per claim 17, Bancroft et al. does not explicitly disclose the characteristics associated with the robot includes one of a group of movement speed and braking distance of the robot. Nakamura et al. discloses a collision avoidance system adjusting a distance between an object and the own unit with respect to the speed of the own unit and/or the object and calculating a braking distance with respect to the speed of the own unit and/or the object to maintain a safe distance between the unit and the object (fig. 3-5 and col. 4, line 19 – col. 5, line 25). It would have been obvious for one of ordinary skill in the art at the time the invention was made to combine the teachings of Bancroft and Nakamura to dynamically adjust the margin area between the robot and object based on the speed and braking distance of the robot to maintain an effective safety distance between two objects.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SZE-HON KONG whose telephone number is (571)270-1503. The examiner can normally be reached on 7:30AM-5PM Mon-Fri, Alt. Fri. Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/538,523
Art Unit: 3661

Page 13

12/2/09

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Examiner, Art Unit 3661

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